

EPA A.I.R.E. Unit Plan

Topic: Air pollution

Grade Level: 5-9

Instructional Setting: Classroom with computer access. 5-40 students

Academic Outcomes/Student Objectives:

- Recognize the importance of focusing on sustainability with air pollution solutions
- Identify ways to reduce air pollution with well-considered plans
- Recognize the relationship between plants, animals, and humans in the world
- Explore and observe environments
- Recognize humans' influences on the environment as individuals and as groups and can cause air pollution (visible and non-visible)
- Observe the impact of weather on air quality
- Recognize conflicts between an issue's stakeholders
- Translate objective and subjective data into standards of air quality
- Understand the importance of energy efficiency in connection with air pollution
- Recognize that the arrangement of living areas, workplaces, and landscaping affects air pollution levels
- Understand that automobile exhaust and power production required to run air conditioning units contribute to air pollution
- Identify the possible sources and types of air pollution in the community based on observations
- Predict and locate on a map potential areas of pollution in the community
- Recognize that invisible air pollutants and weather conditions are involved in creating smog
- Realize that lifestyle choices made by previous generations have impacted the current air quality and air pollution problems
- Understand the increase and demand for selected manufactured goods, automobiles, and energy sources over the last 40 years and its impact on air pollution

Process Skills Addressed: questioning, hypothesizing, predicting, organizing information, collecting data, analyzing data, researching, graphing and interpreting, listening, observing, comparing/contrasting, considering alternative solutions, drawing conclusions, making and justifying decisions, critical and analytical thinking, presenting

Materials Needed: See each activity for particular materials; none are out of the ordinary.

Safety Precautions: This is only a concern if the instructor takes students on field trips.

Total Time for Unit Plan: 15 class periods of 45 minutes each

Pre-Assessment: Standardized pre-assessment with multiple choice and short answer questions.

Post-Assessments: Service Project: Students will design a school carpooling system that will encourage parents to carpool their transportation resources so that fewer vehicles are driven to transport students to and from school. Students will follow and action plan to get local businesses to act as sponsors, get parents to participate, and evaluate the success of the system so that its shortcomings can be improved for the following season.

Standardized Assessment: Standardized post-assessment mirrors the pre-assessment's multiple choice and short answer questions but is extended with an extended constructed response.

Glossary: See A.I.R.E. website. Download the curriculum; the glossary is located at the end. <http://www.epa.gov/region01/students/teacher/aire.html>

Standards Covered: **Colorado**

READING AND WRITING STANDARD 2:

Students write and speak for a variety of purposes and audiences.

In order to meet this standard, students will:

- write and speak for a variety of purposes, such as telling stories, presenting analytical response to literature, conveying technical information, and explaining concepts and procedures, and persuading;
- write and speak for audiences such as peers, teachers, and the community.

READING AND WRITING STANDARD 3:

Students write and speak using conventional grammar, usage, sentence structure, punctuation, capitalization, and spelling.

In order to meet this standard students will:

- know and use correct grammar in speaking and writing;
- apply correct usage in speaking and writing;
- use correct sentence structure in writing; and
- demonstrate correct punctuation, capitalization, and spelling.

READING AND WRITING STANDARD 4:

Students apply thinking skill to their reading, writing, speaking, listening, and viewing.

In order to meet the standard students will:

- make predictions, analyze, draw conclusions, and discriminate between fact and opinion in writing, reading, speaking, listening, and viewing;
- use reading, writing, speaking, listening, and viewing to define and solve problems;
- recognize, express, and defend points-of-view orally and in writing.

READING AND WRITING STANDARD 5:

Students read to locate, select, and make use of relevant information from a variety of media, references, and technological sources.

In order to meet the standard students will:

- select relevant material for reading, writing, and speaking purposes;
- paraphrase, summarize, organize, and synthesize information;
- give credit for other's ideas, images, or information; and
- use information to produce a quality product.

READING AND WRITING STANDARD 6:

Students read and recognize literature as a record of human experience.

In order to meet the standard students will:

- read literature to investigate common issues and interests.

Utah

LANGUAGE ARTS STANDARD: [4070 - 02](#)

Students use comprehension strategies during reading to actively construct the meaning of text.

4070-0201

Make text-to-text, text-to-self, and text-to-world connections.

- Relate text to other relevant texts.
- Relate text to life situations and experiences.
- Relate text to an event or issue in the world.

LANGUAGE ARTS STANDARD: [4070 - 03](#)

Students use comprehension strategies after reading to reflect on, consolidate, and extend meaning.

4070-0301

Summarize and/or synthesize important information from text.

- Write a response.
- Discuss or debate important information.
- Confirm, revise, or reject predictions.
- Share responses to text, e.g., small group and whole class discussions, book clubs, visual presentations, written response, multimedia.
- Connect the text to another text, to a situation in life, and/or to an event or issue in the world.

LANGUAGE ARTS STANDARD: [4070 - 08](#)

Students use comprehension strategies before, during, and after viewing.

4070-0803

Evaluate and respond after viewing to reflect on, consolidate, and extend meaning.

- Summarize key ideas.
- Synthesize information to clarify thoughts, communicate ideas, and solve problems.
- Offer feedback.
- Evaluate the usefulness, reliability, and accuracy of information.

LANGUAGE ARTS STANDARD: [4070 - 09](#)

Students view functional, informational, and literary materials from different periods, cultures, and genres.

4070-0902

Demonstrate competency in viewing and interpreting INFORMATIONAL materials.

- Preview information presented visually by skimming and scanning promotional materials, e.g., advertisements in newspapers, introductory programs, documentary video covers, documentary movie trailers.
- Identify the organization of information presented visually, and use it to recall, construct, and predict, e.g., compare/contrast, cause/effect, question/answer, problem/solution, description, chronology, process.
- Scan for relevant information.

- Determine the accuracy, validity, and reliability of information viewed.
- Use the information gained visually and auditorily to create and share responses.

LANGUAGE ARTS STANDARD: [4070 - 10](#)

Students use process strategies before, during, and after composing.

4070-1002

Use composing strategies to construct a written draft.

- Establish a main idea or identify a central theme for writing.
- Select organizational pattern(s) to structure information, e.g., comparison/contrast, cause/effect, question/answer, problem/solution, description, chronology, process.
- Elaborate ideas through the use of detail, e.g., statistics, examples, illustrations, photos, charts, graphs, tables.
- Generate additional ideas as needed.
- Use information problem-solving skills, i.e., The Big Six: task definition, information-seeking strategies, location and access, use of information, synthesis, evaluation.

4070-1004

Edit text to conform to the conventions of standard English that include capitalization, punctuation, usage, and correct spelling.

- Identify and correct errors in usage, e.g., misplaced modifiers, unnecessary fragments, run-on sentences, incorrectly combined sentences, incorrect subject-verb agreement, incorrect adverb usage, incorrect use of the possessive case, incorrectly applied present and future tenses.
- Identify and correct errors in capitalization, e.g., sentence beginning, proper adjectives and nouns, titles, proper noun phrases.
- Identify and correct errors in punctuation, e.g., appropriate end punctuation, introductory comas, commas in a series, quotation marks with titles of chapters, use of unnecessary commas, capitals with historic periods.
- Identify and correct misspellings of words in the context of sentences.
- Evaluate own and others' writing according to standard language usage.

4070-1005

Participate in post-writing strategies to make writing public.

- Prepare finished products for publication, e.g., for school assignments in language arts and other content courses, on electronic bulletin boards, for public display, in school and commercial publications.
- Share with peers, teachers, family members, and others

LANGUAGE ARTS STANDARD: [4070 - 11](#)

Students write functional, informational, and literary texts for various purposes, audiences, and situations.

4070-1102

Demonstrate competency in writing INFORMATIONAL text.

- Use writing process strategies to construct informational text, e.g., school reports, essays, magazine and newspaper articles.
- Use text features to indicate organization, e.g., headings, sub headings, other visual information.
- Select organizational pattern(s) to indicate important information, e.g., comparison/contrast, cause/effect, question/answer, problem/solution, description, chronology, process.
- Use accurate, valid, and reliable information.
- Use a mix of types of text organization as necessary.